

## Examples of Existing and Potential Future Trading Programs

**Table 2.** Programs Under Development/Consideration.

Program/Location What's Being Traded Trade Type(s)	What's Being Considered?	Who's Involved?	Status
Chatfield Basin, CO phosphorus point/nonpoint	Modeling is under way to determine TMDL, potential responsibilities, and trading potential.	EPA Region 8 (Bruce Zander 303-312-6846).	Under development.
Chehalis River Basin, WA pollutant(s) to be determined point/nonpoint, nonpoint/nonpoint	The Chehalis River was identified as a candidate for trading in study done for the Washington Department of Ecology by Apogee Research, Inc. (1992). A subsequent scoping effort collected additional information (economic, regulatory, political, etc.) and confirmed potential for trading. A TMDL for the segment under consideration has recently been completed, and trading opportunities remain uncertain.	Washington Department of Ecology (360-407-3600). Other stakeholders include the Chehalis River Council and three county conservation districts.	Trading opportunities will depend on how wasteload and load allocations are developed.
Chesapeake Bay tributaries, MD nitrogen, phosphorus point/nonpoint, nonpoint/nonpoint	Under the state of Maryland's nutrient reduction strategy developed for each major tributary to the Chesapeake Bay, some tributary plans include effluent trading as a potential option. A pilot project to examine trading opportunities among six POTWs discharging to the Lower Potomac River was begun but not completed.	Maryland Department of the Environment (410-631-3680); EPA Chesapeake Bay Program (410-267-5700).	Tributary-specific and site-specific issues are still being analyzed to determine trading opportunities.
Clear Creek, CO pollutant(s) to be determined point/nonpoint	Stakeholders are considering a program where point sources would "adopt" abandoned nonpoint sources (primarily mines) and clean up the sites, or otherwise reduce loadings in exchange for credits that could be applied to effluent discharge permits. Stakeholders are initially considering all types of trading, including cross-pollutant and banking scenarios.	Clear Creek Watershed Forum (303-692-3513); EPA Region 8 (Holly Fliniaux 303-293-1603). Other stakeholders include the Colorado Dept. of Health and Coors.	Stakeholders recently completed a consensus-building process regarding the trading concept. Next steps will involve more detailed scientific and economic analysis.
Little Deep Fork DO, phosphorus source(s) to be determined	An intensive water quality study was conducted as part of a TMDL development project and some potential for trading was identified. The area is generally cattle country, with some cropland, and urban areas. Preliminary analysis indicates animal BMPs may potentially be implemented in lieu of, or to delay, POTW upgrades.	Indian Nations Council of Governments (Richard Smith 918-584-7526); Oklahoma Conservation Commission (Phillip Moershel 405-842-8744).	The TMDL is ongoing. Water quality managers are currently characterizing nonpoint source loading and developing and implementing BMPs. Trading is scheduled to be considered after results of these efforts are evaluated.

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Sacramento River, CA metals Source(s) to be determined	Stakeholders are discussing the potential for trading to address metals loading issues in the Sacramento River above the City of Sacramento. Interest is primarily due to high metals loadings from abandoned mines and agricultural chemicals relative to municipal and stormwater loadings.	EPA Region 9 (Dave Smith 415-744-2012). Also the City of Sacramento and the Central Valley Regional Water Quality Control Board.	The current focus is to set up a regional monitoring program to better assess metals loading sources and potential controls. Rough loading estimates exist. Trades are unlikely to occur before 1997.
San Joaquin River, CA selenium point/point, point/nonpoint	The Environmental Defense Fund (EDF), the state of California, EPA, and agricultural interests have investigated options for using tradable discharge permits to find least-cost solutions to selenium discharge control problems related to Central Valley irrigated agriculture operations. See EDF's "Plowing New Ground" report for details.	EDF (Terry Young 510-658-8008). Also irrigation districts, Central Valley Water Resources Control Board, EPA, and the Natural Resources Defense Council.	Trading may be a year or two away. EDF has received another grant to help market trading. The proposal to reopen San Luis Drain, an agricultural tailwater drainage structure that discharges to San Joaquin River, will impact trading issues. The proposed program might be a vehicle for setting up load reductions and drainage districts.
South San Francisco Bay, CA copper point/point, point/nonpoint	Three POTWs and a stormwater management agency were directed by the Regional Water Board to negotiate how to obtain a 900 lb/yr copper loading reduction needed to attain a TMDL. The 900 lb goal is in addition to individual wasteload allocations already set for each POTW and the stormwater utility. The four parties were to report back to the Board regarding how the reduction target would be met and to identify specific responsibilities for actions.	EPA Region 9 (Dave Smith 415-744-2012). Also the Cities of San Jose, Palo Alto, and Sunnyvale; the Santa Clara Valley Nonpoint Source Pollution Control Program; and the San Francisco Regional Water Quality Control Board.	Parties have negotiated a Memorandum of Agreement and are now working on a stormwater source assessment to fill in information gaps on stormwater load reduction feasibility.

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Tampa Bay, FL  nitrogen, total suspended solids  point/point, point/nonpoint, nonpoint/nonpoint	Several trading initiatives are under consideration. In one, stakeholders may develop a trading program to supplement the allocation of nitrogen loads under a pollutant loading reduction goal. In another, the City of Tampa is considering a trading scheme under which some stormwater retrofit requirements placed on redevelopment projects in specific sections of the city would be waived. In exchange, either the city or the developer would contribute funds to a "stormwater bank" that would pay for larger projects elsewhere in the city. An offset program for specific tributaries also is being considered, in which new and expanding point sources would be required to partially or fully offset their N and/or TSS loads through trading with other point or nonpoint sources.	Tampa Bay National Estuary Program (813-893-2765). Other stakeholders include Tampa Bay Regional Planning Council; City of Tampa; and other industrial, municipal, and agricultural interests.	Trading is under consideration; implementation will depend on a variety of scientific, economic, and political issues.
Truckee River, NV  nitrogen and flows  point/nonpoint	A not-yet-signed agreement among the U.S. Department of the Interior (DOI), EPA, the state of Nevada, Reno-Sparks municipal government, and the Pyramid Lake Paiute Tribe will provide for DOI and Reno-Sparks to each pay \$12 million per year to acquire water rights to be dedicated to instream flow down to Pyramid Lake. In exchange for city water purchases, Nevada would revise a TMDL and permits to allow increased nitrogen discharge to take advantage of increased assimilative capacity associated with flow augmentation. Reno-Sparks is seeking a State Revolving Fund (SRF) loan to finance water purchases. In a related effort, EPA provided a grant to the University of California-Berkeley to study the potential use of economic incentives for pollution control for the Truckee River.	EPA Region 9 (Dave Smith 415-744-2012, Cheryl McGovern 415-744-2013); University of California at Berkeley (510-643-5364). Also DOI, Nevada Division of Environmental Protection, Reno-Sparks, Indian tribes.	The details of this program are still being worked out. The tribe is concerned that the city wants to allocate all of the increased assimilative capacity to its wasteload allocation (despite paying only half the cost) and prefers to keep much of the loading capacity in reserve unallocated. Some concerns about model accuracy and whether the river is now complying with water quality standards also exist.
Yakima River Basin, WA  pollutant(s) to be determined  pource(s) to be determined	Battelle's Pacific Northwest Laboratory is working with stakeholders in the basin to address pollutant and water quantity issues, and trading pollutants and/or water rights may be part of the solution. In an unrelated study commissioned by the Washington Department of Ecology, the Yakima River was identified as a candidate for point/nonpoint source trading (See Chehalis River above).	Battelle (509-372-4342). Other stakeholders include: the WA Department of Ecology, the Bureau of Reclamation the Yakama Indian Nation; and a watershed council.	Modeling capabilities are under development and preliminary analysis is under way.

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**Table 3.** EPA Studies.

Program/Location	What's Being Considered?	Who's Involved?	Status
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Boone Reservoir, TN nutrients point/nonpoint	This study examined the cost-effectiveness of both point and nonpoint source controls ( <i>Sobatka, 1989</i> ). The study concluded that the most cost-effective means of controlling phosphorus, nitrogen, and BOD involved a combination of point and nonpoint source controls. Several agricultural BMPs were among the least expensive choices, followed by upgrades at selected POTWs. BMPs for unconfined animals, urban BMPs, and septic tank renovations were among the most expensive.	EPA Office of Policy, Planning, and Evaluation (202-260-5363) sponsored the study. Study conducted in conjunction with Tennessee Valley Authority.	No program developed.
Wicomico River, MD phosphorus point/nonpoint	This case study simulation estimated the potential cost savings from point/nonpoint source trading in the Wicomico Basin ( <i>Industrial Economics, 1987</i> ). The results demonstrated that trading offers potentially significant cost savings and water quality benefits.	EPA Office of Policy, Planning, and Evaluation (202-260-5363) sponsored the study.	No program developed.